



## **Design and Certification Issues**

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Investigations Into Trans World Airlines Flight 800



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# **Current Design and Certification Philosophy**

- Assumes that a flammable fuel/air mixture exists at all times
- Attempts to eliminate ignition sources



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# **Flaws in the Current Design and Certification Philosophy**

- We cannot eliminate all ignition sources that have been identified
- We cannot predict all possible ignition sources



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# **Failure Mode And Effects Analyses Are Not Always Reliable**

- Unrealistic and/or flawed data
- Inability to predict all failure modes and probability of occurrence
- Exclusion of some failure modes
- Reliance on maintenance and inspection to detect failures



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# **December 1996 Safety Recommendations to the FAA**

- Preclude operation with explosive fuel/air mixtures in fuel tanks
- Consider long-term design modifications, such as fuel tank inerting
- Require short-term operational changes to reduce potential for flammable mixtures



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# **FAA Response to December 1996 Safety Recommendations**

- Proposed rulemaking to “minimize flammability in future designs”
- Evaluate ventilation to cool center wing tank
- Evaluate ground cooling instead of air conditioning packs
- Evaluate fuel tank inerting systems



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# **Certification Issues for Future Consideration**

- Adequacy of risk analyses used to demonstrate compliance with regulations
- Need for reliable, independent means to overcome catastrophic effects of failure – regardless of probability of failure